UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/774,682	02/09/2004	Thomas Rueckes	112020.129 US2 (Nan-6)	9428

23483 7590 01/27/2006

WILMER CUTLER PICKERING HALE AND DORR LLP
60 STATE STREET
BOSTON, MA 02109

EXAMINER	
COLEMAN, WILLIAM D	

ART UNIT	PAPER NUMBER
2823	

DATE MAILED: 01/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/774,682	RUECKES ET AL.	
	Examiner	Art Unit	
	W. David Coleman	2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 January 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

2. Applicant's arguments, see remarks/arguments, filed January 17, 2006, with respect to the rejection(s) of claim(s) 1-15 under 35 U.S.C. 103(a) as being unpatentable over Rueckes et al., "Carbon Nanotube-Based Nonvolatile Random Access Memory for Molecular Computing" in view of Kaneto et al., "Electrical Conductivities of Multi-wall Carbon Nano Tubes", have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Cole et al., U.S. Patent 6,919,730 B2.

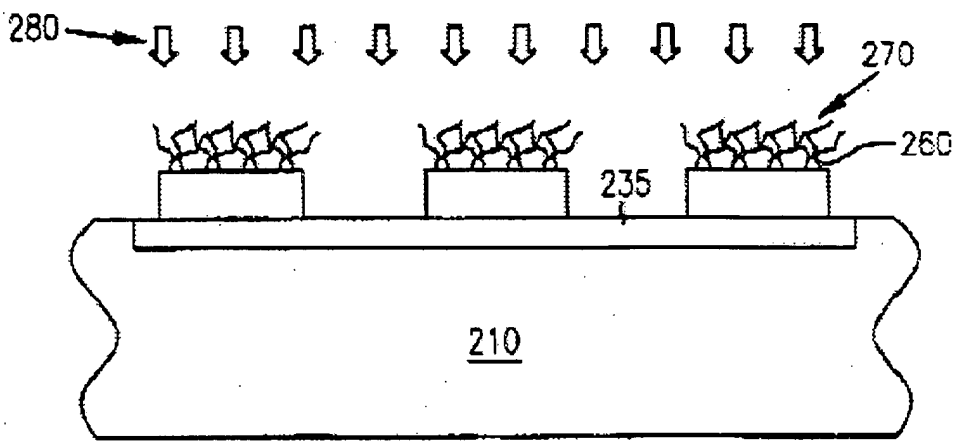
Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-15 are rejected under 35 U.S.C. 102(e) as being anticipated by Cole et al., U.S. Patent 6,919,730 B2.

Cole discloses an assembly as claimed. See **FIGS. 1A-5** where Cole teaches the following limitations.



5. Pertaining to claim 1, Cole teaches an assembly including a substrate **210** and a conductive trace **240** disposed on the substrate, wherein the trace includes a plurality of unaligned nanotubes **260** for providing a plurality of conductive pathways along the trace.

6. Pertaining to claim 2, Cole teaches the assembly of claim 1 wherein the nanotube segments include single walled carbon nanotubes (column 1, line 35).

7. Pertaining to claim 3, Cole teaches the assembly of claim 1 wherein the nanotubes include multi-walled carbon nanotubes (front page of patent with reference to Varghese et al., "Gas Sensing Characteristics of Multi-Wall Carbon Nanotubes").

8. Pertaining to claim 4, Cole teaches the assembly of claim 1 wherein the nanotube segments have different lengths (see the explanation of figure 2D on page 95 where Rueckes discloses various minimum bistable device sizes).

9. Pertaining to claim 5, Cole teaches the assembly of claim 1 wherein the nanotubes include nanotubes having a length shorter than the length of the article (see **FIG. 2D**).

10. Pertaining to claim 6, Cole teaches an assembly including a substrate and a conductive trace disposed on the substrate, wherein the trace includes an electrical network of a plurality of unaligned nanotubes in contact with other nanotubes to provide a plurality of conductive pathways along the trace.

11. Pertaining to claim 7, Cole teaches the assembly of claim 6 wherein the nanotubes include single walled carbon nanotubes.

12. Pertaining to claim 8, Cole teaches the assembly of claim 6, wherein the nanotubes include multi-walled carbon nanotubes.

13. Pertaining to claim 9, Cole teaches the assembly of claim 6 wherein the nanotubes have different lengths.

14. Pertaining to claim 10, Cole teaches the assembly of claim 6 wherein the nanotubes include nanotubes having a length shorter than the length of the trace.

15. Pertaining to claim 11, Cole teaches an assembly including a substrate and a conductive trace of predefined shape, the conductive trace being over the substrate, the conductive trace including a plurality of unaligned nanotubes for providing a plurality of conductive paths along the extent of the trace.

16. Pertaining to claim 12, Cole teaches an assembly including a substrate, at least one metal electrode, and a conductive trace of predefined shape, the conductive trace being over the substrate, the conductive trace including a plurality of unaligned nanotubes providing a plurality of conductive paths along the extent of the trace, and the metal electrode being over at least a portion of the conductive trace, the metal electrode being formed by a metalization step.

17. Pertaining to claim 13, Cole teaches a wafer substrate structure having a non-woven fabric of unaligned nanotubes covering a major surface of the wafer substrate and wherein the nanotubes of the fabric are arranged in accordance with inherent self-assembly traits of the nanotubes (see FIG. 1B).

18. Pertaining to claim 14, Cole teaches a wafer substrate structure having a non-woven fabric of unaligned nanotubes covering a major surface of the wafer substrate and wherein the fabric is substantially a monolayer of nanotubes.

19. Pertaining to claim 15, Cole teaches a wafer substrate structure having a non-woven fabric of unaligned nanotubes covering a major surface of the wafer substrate and wherein the fabric has a controlled density of nanotubes.

Conclusion

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to W. David Coleman whose telephone number is 571-272-1856. The examiner can normally be reached on Monday-Friday 9:00 AM - 5:30 PM.

21. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

22. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

W. David Coleman
Primary Examiner
Art Unit 2823

WDC